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New records of seven species of pholcid spiders (Araneae, Pholcidae) from the northern Argentina

Víctor M. Torres[1, 2], **Paolo L. Pardo**[1, 2], **Andrea X. González-Reyes**[1], **Sandra M. Rodriguez-Artigas**[1, 2] and **José A. Corronca**[1, 2*]

1 Instituto para el Estudio de la Biodiversidad de Invertebrados. Facultad de Ciencias Naturales, Universidad Nacional de Salta, Av. Bolivia 5150, Salta, CP 4400, Argentina
2 Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET-CCT Salta), Av. Bolivia 5150, Salta, CP 4400, Salta, Argentina
* Corresponding author. E-mail: jcorronca@gmail.com

Abstract: We report new records of pholcid species for northern Argentina. *Guaranita yaculica* Huber, 2000 and *Mesabolivar uruguayensis* Machado Laborda, Simó & Brescovit, 2013 are reported for the first time for Corrientes province, whereas *Aymaria calilegua* Huber, 2000 and *Nerudia atacama* Huber, 2000 are for the first time reported for Salta province. The last corresponds to a new record for Argentina. We also expand the known distribution of *Guaranita goloboffi* Huber, 2000, *Chibchea salta* Huber, 2000, and *Pholcus phalangioides* (Fuesslin, 1775) for Salta province.

Key words: new records, distribution, spiders, Pholcidae, northern Argentina

The spider family Pholcidae Koch, 1850 currently includes 1,407 species in 78 genera (World Spider Catalog 2014). Pholcids are among the most species-rich spider families, and most species occur in tropical and subtropical regions all over the world (Huber in press). They are often found in geographic areas and habitats that are severely threatened by human impact (Huber 2005). Members of this family are mostly easily distinguished by the shape of the male pedipalp, which is provided with a characteristic process on the palpal tarsus, called "procursus". Other diagnostic characters are: chelicerae modified in males (extremely diverse in shape, with apophyses, modified hairs, cones, spines, etc.); a very high clypeus; the general arrangement of eyes (two triads and one median pair; the latter may be absent); pseudosegmented tarsi; and a sclerotized plate covering the female internal genitalia. The legs in this family are often extremely long and thin but some species have relatively short legs (Huber 2011).

Pholcid spiders inhabit a wide variety of microhabitats and this is reflected in their body shape and coloration. Species in the leaf litter and under objects on the ground (dead leaves, rocks, logs on the ground, etc.) tend to be small and compact, with short legs, whereas species living among the vegetation tend to have long and slender bodies and legs (Huber in press). Several genera include representatives that are mainly found on protected rock walls or in caves, and this may in part explain the high number of synanthropic species included in the family (Huber 2011).

Previous studies in Argentina reported relative low pholcid diversity, which is concentrated in the northwestern part of the country (Huber in press). In Argentina, there are currently seven genera with 16 cited species (World Spider Catalog 2014), some of them occur at high altitudes in the Andes, and as far south as Río Negro and Chubut provinces. There are no data about the conservation status for any Argentine pholcid. Many pholcid species seem to have small distribution ranges, making them particularly vulnerable to extinction (Huber in press). Our limited knowledge about distributions of Argentine pholcids is partly due to scarce collections realized in Argentina, partly to patchy collecting efforts. Because of this, it is interesting to record new localities of Argentine Pholcidae species collected in different environments in the north of the country where the authors have been working for the last 10 years.

The material reported here comes from seasonal samplings realized by the IEBI (Instituto para el Estudio de la Biodiversidad de Invertebrados) team in nine ecoregions of northern Argentina. The ecoregions of Yungas, Chaco Serrano, Monte de Sierras y Bolsones, Prepuna-Puna were sampled in the province of Salta during the 2005–2007 (Research Project CIUNSa#1850/4 and CIUNSa#1601/0, and Project#771 of the Ministry of Environment and Sustainable Development, Government of the Province of Salta). In the province of Corrientes, the ecoregions of Campos y Malezales, Espinal, Esteros del Iberá, Delta del

Paraná e Islas y Bosque Atlántico were sampled during 2006–2007 (Research Project PIP-CONICET 2005–2007, supervised by Dr. M.C. Coscarón-UNLP); and finally the Yungas ecoregion was sampled in the Calilegua National Park, province of Jujuy, during 2010–2011 (Research Project of the National Park Administration 2010–2014, and PIP-CONICET 2013–2015 supervised by Dr. J.A. Corronca).

Sampling followed a standardized protocol, which included pit-fall trapping for epigeal spiders, and suction samples for spiders on vegetation taken by a G-Vac (Garden-Vaccum). Pitfall samples were taken positioning 10 pitfalls traps at 10 m intervals along a transect line in each site; the pitfall traps were made of plastic containers (7.5 × 12.2 × 5.2 cm, upper end diameter × depth × lower end diameter) filled with aqueous salt solution (1 kg salt/8 L water) plus a few drops of detergent. Ten G-Vac samples were taken in each site; each G-Vac sample consisted in vacuuming a 1 m² vegetation area for 1 minute. Samples were stored and transported in pre-labeled polyethylene bags containing ethanol (70%).The specimens were observed under an Olympus Stereomicroscope SZ4540 and species were identified following the available taxonomic literature (Huber 2000, in press). Images were taken using a Canon Power-Shot G10 digital camera mounted on the microscope. Maps were generated using QGis 2.4.0-Chugiak software (QGIS Development Team 2014).

Specimens are deposited in the MCN-IEBI Collection, Argentina (Museo de Ciencias Naturales, Instituto para el Estudio de la Biodiversidad de Invertebrados-Facultad de Ciencias Naturales, Universidad Nacional de Salta).

Guaranita Huber, 2000

COMPOSITION AND DISTRIBUTION. This genus is represented by three described species, all of them recorded in Argentina (Huber 2000; World Spider Catalog 2014).

Guaranita yaculica Huber, 2000
(Figures 1 and 2A–B)

DIAGNOSIS. Distinguished from *G. goloboffi* Huber, 2000 and *G. munda* (Gertsch, 1982) by the large roundish dorsal flap on the procursus (see arrow in Figure 2B) (Huber 2000).

DISTRIBUTION AND HABITAT. The species was recorded by Huber (in press) for Salta province and the entrance of the Calilegua National Park, Jujuy province. We found specimens of *G. yaculica* in sites of Caimancito oilfield,

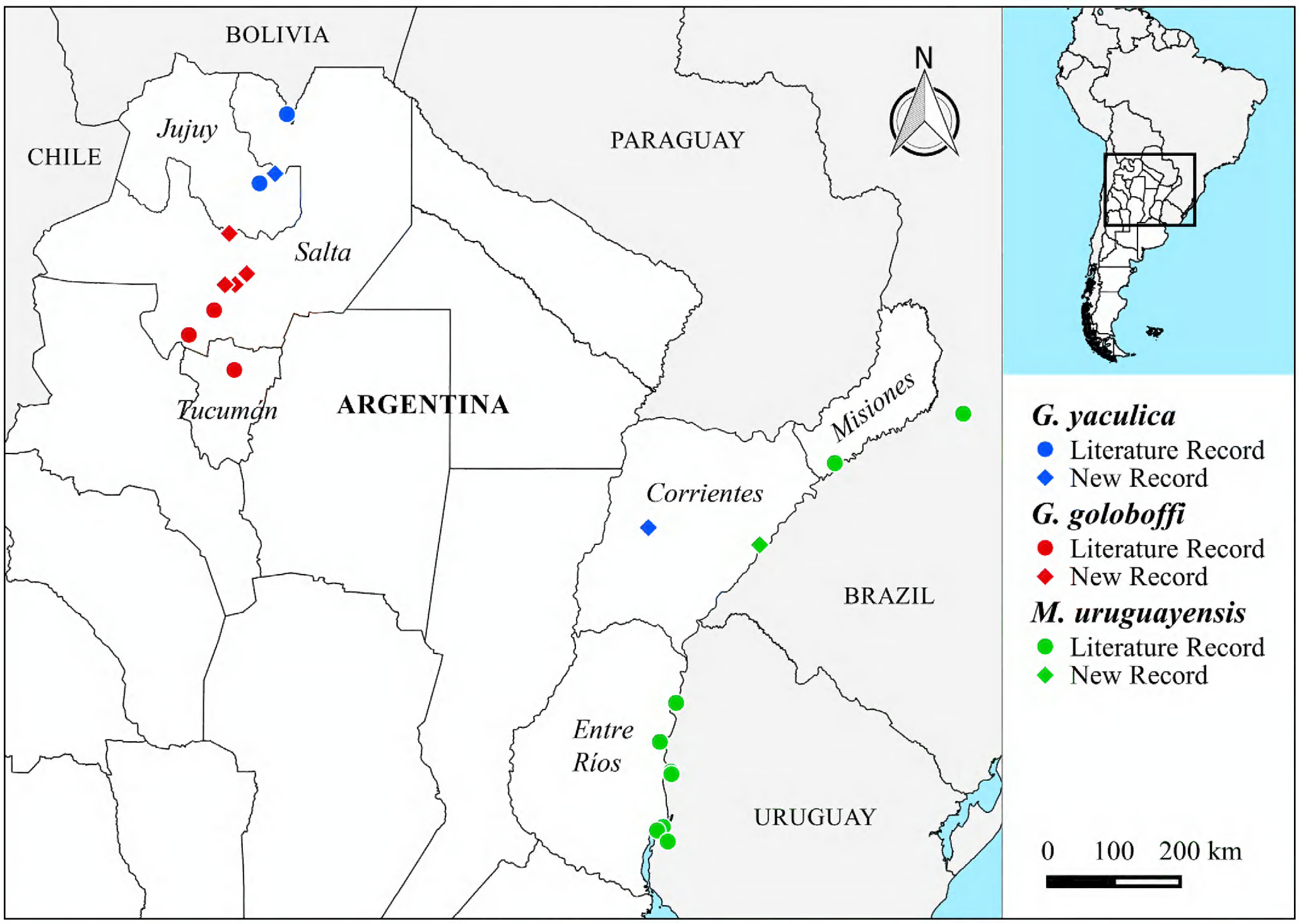

Figure 1. Geographic distribution of *Guaranita yaculica* and *G. goloboffi* at Jujuy and Salta provinces, Argentina, and *Mesabolivar uruguayensis* at northeastern of Argentina, and southern Brazil and Uruguay.

Calilegua National Park (Jujuy), and in the Esteros del Iberá ecoregion, Corrientes province. The latter record is the first for this species in northeastern Argentina.

SPECIMENS EXAMINED: Argentina. Jujuy province: Ledesma department: Calilegua National Park, Caimancito oilfield, around Oil Well #4 (23°37′01″ S, 064°36′03″ W), male, immature, 26 October 2010, MCN-IEBI #003-000691; Caimancito oilfield, around Oil Well #35 (23°37′10″ S, 064°35′41″ W), male, female, 07 June 2011, MCN-IEBI #003-000692; Caimancito oilfield,

Figure 2. *Guaranita yaculica* male. **A**, dorsal view. **B**, left palp retrolateral view. *Guaranita goloboffi* male. **C**, dorsal view. **D**, left palp retrolateral view. *Mesabolivar uruguayensis* male. **E**, dorsal view. **F**, left palp retrolateral view. Scale lines: 0.2 mm.

around Oil Well #1 (23°38′43″ S, 064°36′15″ W), male, female, 26 October 2010, MCN-IEBI #003-000690; male, 7 June 2011, MCN-IEBI #003-000693; Calilegua National Park, north margins of Zanjón Seco string (23°41′13″ S, 064°34′26″ W), male, 7 June 2011, MCN-IEBI #003-000694. Corrientes Province: San Roque department: Provincial Route #22, near Tacuarita (28°51′05″ S, 058°26′24″ W), 3 males, 4 immatures, 21 November 2006, MCN-IEBI #003-000689.

Guaranita goloboffi Huber, 2000
(Figures 1 and 2C–D)

DIAGNOSIS. The members of this species are distinguished from *G. yaculica* and *G. munda* by the smaller dorsal flap on the procursus (see arrow in Figure 2D) (Huber 2000).

DISTRIBUTION AND HABITAT. This species is known in arid localities of Tucumán and Salta provinces, Argentina (Huber 2000, in press). We report new records of *G. goloboffi* for the Chaco Serrano and Yungas ecoregions of the Salta province. These new records expand the northern limit of this species, and they document the species' presence in ecoregions where it has not been recorded previously. The new records (La Caldera and Metan Departments) correspond to a mountain forest of Yungas, which is a dense and humid forest of perennial vegetation with a high biodiversity in the North of Argentina (Bertonatti and Corcuera 2000).

SPECIMENS EXAMINED: Argentina. Salta province: La Caldera department: Road to El Carmen (24°31′13″ S, 065°21′03″ W), 2 males, 6 March 2007, MCN-IEBI #003-000740; Metán department: Road to Cabra Corral dam (25°7′22″ S, 065°3′44″ W), immature, 3 November 2006, MCN-IEBI #003-000737; Provincial Route #47, 11 km E of Cabra Corral dam (25°15′35″ S, 065°13′15″ W), 2 males, female, 27 April 2006, MCN-IEBI #003-000731; female, immature, 6 March 2007, MCN-IEBI #003-000732; La Viña department: Provincial Route #47, 9 km E of Cabra Corral dam (25°17′10″ S, 065°15′08″ W), 4 males, female, immature, 27 April 2007, MCN-IEBI #003-000738; female, 1 August 2006, MCN-IEBI #003-000733; 2 immatures, 3 November 2006, MCN-IEBI #003-000734; Provincial Route #47, 7 km E of Cabra Corral dam (25°17′40″ S, 065°17′01″ W), 2 males, 1 August 2006, MCN-IEBI #003-000736; 3 males, immature, 3 November 2006, MCN-IEBI #003-000735; Provincial Route #47, near to Cabra Corral dam, 6 km E of Coronel Moldes (25°17′16″ S, 065°25′13″ W), 2 males, 3 November 2006, MCN-IEBI #003-000739.

Mesabolivar González-Sponga, 1998

COMPOSITION AND DISTRIBUTION. The genus *Mesabolivar* is among the most species-rich and widely distributed pholcid genera in South America (Huber 2000). It currently includes 48 species, six of them with records in Argentina (World Spider Catalog 2014).

Mesabolivar uruguayensis Machado, Laborda, Simó & Brescovit, 2013
(Figures 1 and 2E–F)

DIAGNOSIS. Males can be distinguished from congeners by the shape of the procursus, straight with a distinctive sclerotized tip (see arrow in Figure 2F); females by the presence of one pair of projections in line with the epigynal pocket, both close to the posterior edge of the epigynum (Machado et al. 2013).

DISTRIBUTION AND HABITAT. From northeastern Argentina to southern Brazil and Uruguay. This species can be found in riparian forest and in urban sites, outside houses. We provide a new record of *M. uruguayensis* for the Campos y Malezales ecoregion in Corrientes province. The environments in this ecoregion are similar to those mentioned above for the previously known localities.

SPECIMENS EXAMINED: Argentina. Corrientes province: General Alvear department: Provincial Route #14, Aguapey River, 5 km W of Alvear (29°06′03″ S, 056°36′24″ W), male, female, 12 June 2007, MCN-IEBI #003-000682; Same loc. (29°06′03″ S, 056°36′18″ W), male, female, 5 immatures, 12 June 2007, MCN-IEBI #003-000683.

Chibchea Huber, 2000

COMPOSITION AND DISTRIBUTION. *Chibchea* is apparently restricted to the Andean corridor (Huber 2000), ranging from Colombia and Venezuela in the north, until the northern regions of Chile and Argentina in the south. The genus currently includes 16 species (World Spider Catalog 2014), of which only *Chibchea salta* Huber, 2000 occurs in northern Argentina.

Chibchea salta Huber, 2000
(Figures 3 and 4A–B)

DIAGNOSIS. Distinguished from congeners by the relatively complex apophyses on the procursus tip (Huber 2000; one of them T-shaped, see arrow in Figure 4B).

DISTRIBUTION AND HABITAT. *C. salta* has been recorded in different localities of the Yungas forests in Salta province (Huber 2000) and Calilegua National Park, Jujuy province (Huber in press). Rubio and Acosta (2011) added several additional records for the central area of Salta province. Here, we give new records of this species from Jujuy and Salta provinces.

SPECIMENS EXAMINED: Argentina. Jujuy province: Ledesma department: Calilegua National Park, Caimancito oilfield, around Oil Well #35 (23°37′10″ S, 064°36′03″ W), male, 7 June 2011, MCN-IEBI #003-000723; Caimancito oilfield, around Oil Well #1 (23°38′43″ S, 064°36′15″ W), male, 07 June 2011, MCN-IEBI #003-000722. Salta Province: Salta Capital department: Quebrada de San Lorenzo (24°49′55″ S, 065°30′16″ W), 2 males, 3 immatures, 3 November 2006, MCN-IEBI #003-000724; male, 2 immatures,

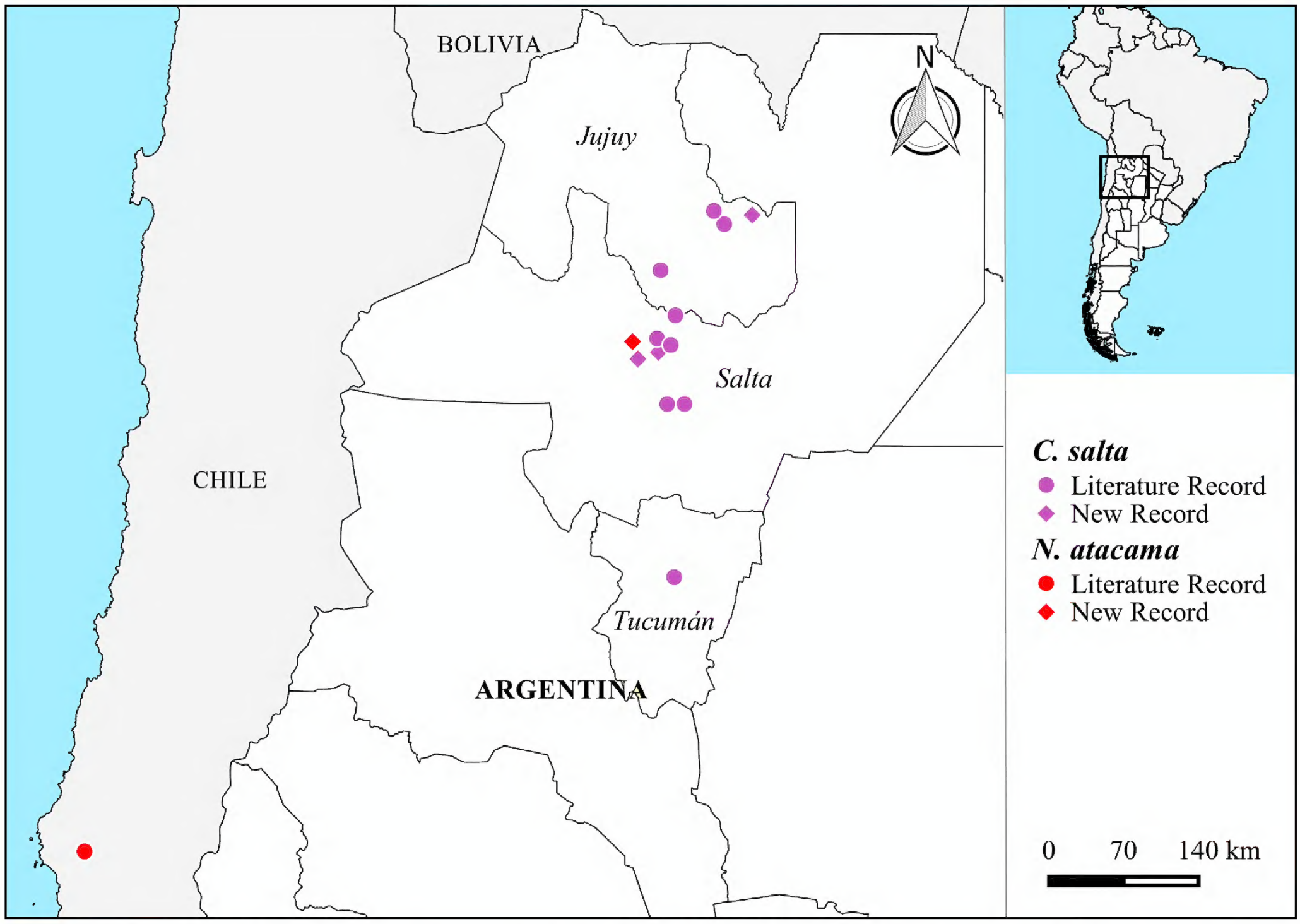

Figure 3. Geographic distribution of *Chibchea salta* at Jujuy, Salta and Tucumán provinces, Argentina, and *Nerudia atacama* for Argentina and Chile countries.

6 March 2007, MCN-IEBI #003-000725; Rosario de Lerma department: Rosario de Lerma, National Route #51, 6 km W of Campo Quijano (24°53′15″ S, 065°42′11″ W), male, 24 February 2006, MCN-IEBI #003-000721.

Nerudia Huber, 2000

Composition and distribution. *Nerudia* is a monospecific genus (World Spider Catalog 2014), and is only known from Huasco, Atacama, Chile.

Nerudia atacama Huber, 2000
(Figures 3 and 4C–D)

Diagnosis. *N. atacama* is a tiny, short-legged pholcid with eight eyes, without thoracic groove; easily distinguished from other short-legged pholcids by the dorsally bent procursus and the two long bulbal projections (see arrows in Figure 4D) (Huber 2000).

Distribution and habitat. In the MCN-IEBI collection we found specimens collected at 2274 m above sea level (a.s.l.), in the Monte de Sierras y Bolsones ecoregion of Salta province, Argentina. This is the first record of the species for Argentina, and it considerably expands the known distribution and altitudinal range of *N. atacama*. The place where the new specimens were collected is characterized by an arid environment very similar in climate and vegetation to that of the Chilean locality. This species was recorded in a G-Vac sample taken on the vegetation characteristic of this ecoregion represented by *Larrea* sp. that gives phyto-sociological unity to the Monte de Sierras y Bolsones ecoregion. Different species of that plant genus forming 1.5–3.0 m high thickets, mixed together with *Prosopis* sp. and various species of cacti (Bertonatti and Concuera 2000), especially *Trichocereus terscheckii*.

Specimens examined: Argentina. Salta province: Rosario de Lerma department: Provincial Route #51, 35 km NW of Rosario de Lerma (24°44′16″ S, 065°45′16″ W), 2 males, 24 February 2006, MCN-IEBI #003-000527.

Aymaria Huber, 2000

Composition and distribution. The genus *Aymaria* currently includes seven species and it is distributed in Argentina, Bolivia, Peru and the Galapagos Islands (World Spider Catalog 2014). According to Huber (in press), this genus is largely Andean with its southern limit in Calilegua (Jujuy, Argentina). It seems to be less tolerant against arid conditions than *Chibchea*.

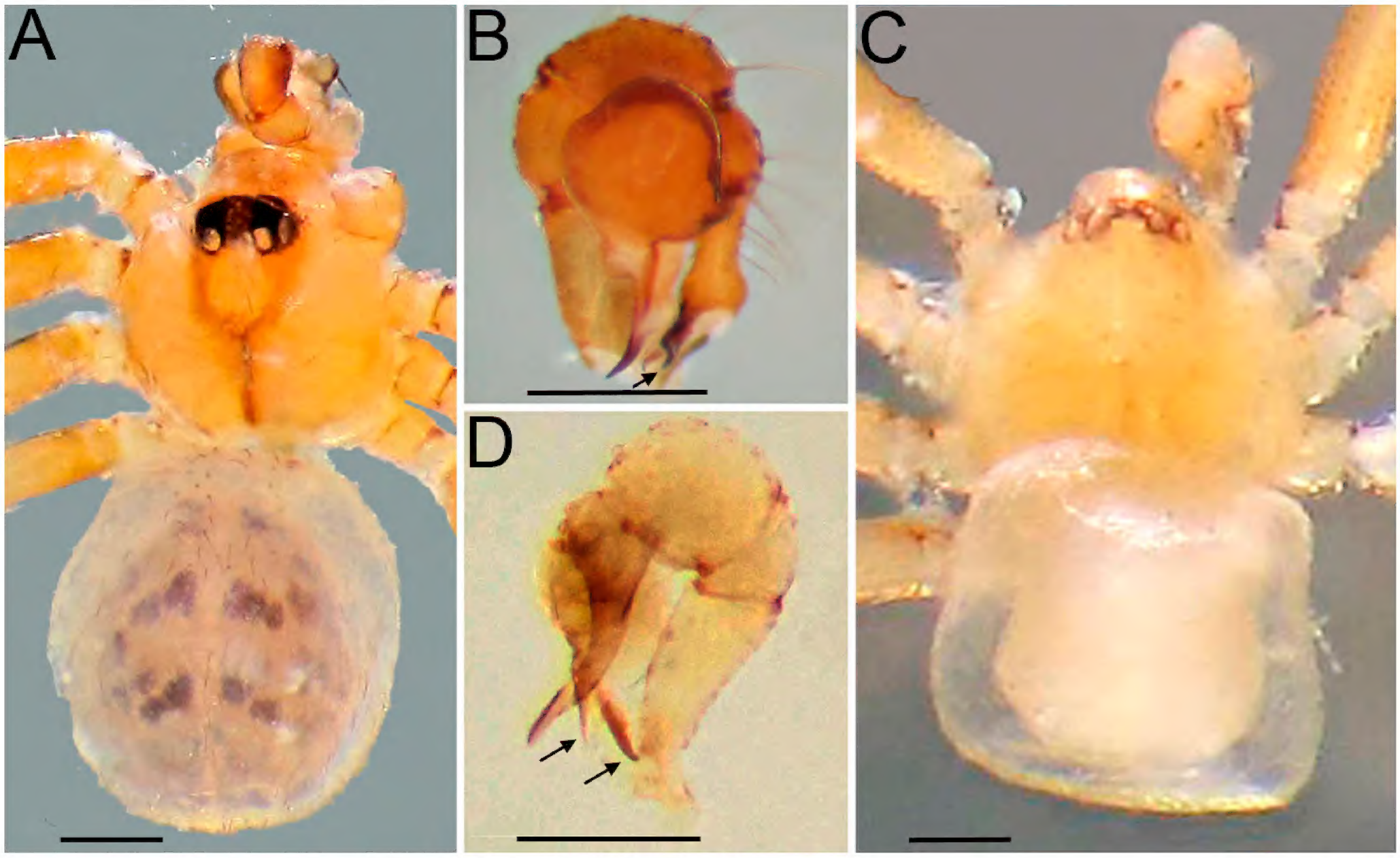

Figure 4. *Chibchea salta* male. **A**, dorsal view. **B**, left palp prolateral view. *Nerudia atacama* male. **C**, dorsal view. **D**, left palp retrolateral view. Scale lines: 0.2 mm.

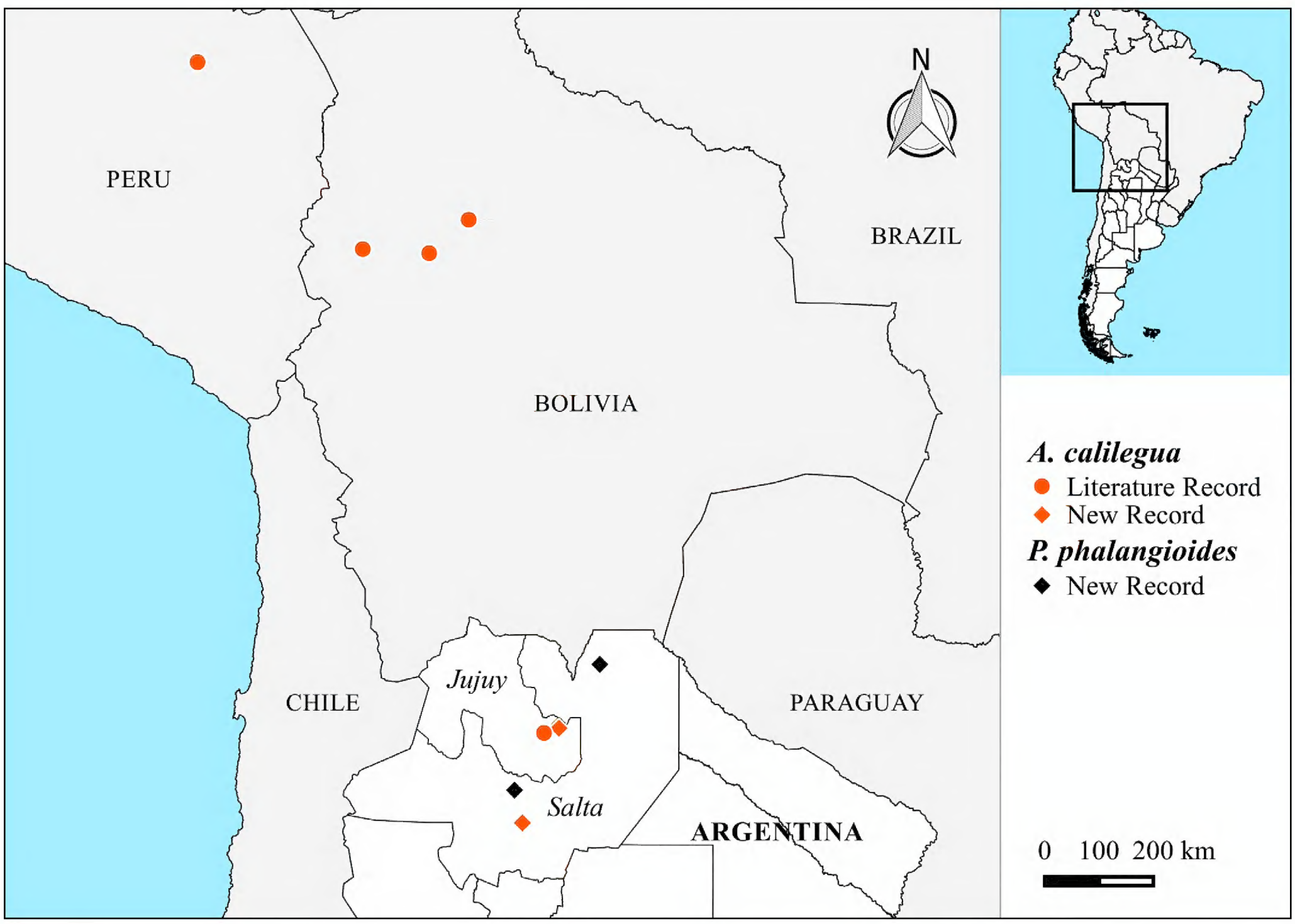

Figure 5. Geographic distribution of *Aymaria calilegua* at Peru, Bolivia and Argentina, and *Pholcus phalangioides* for Salta province, Argentina.

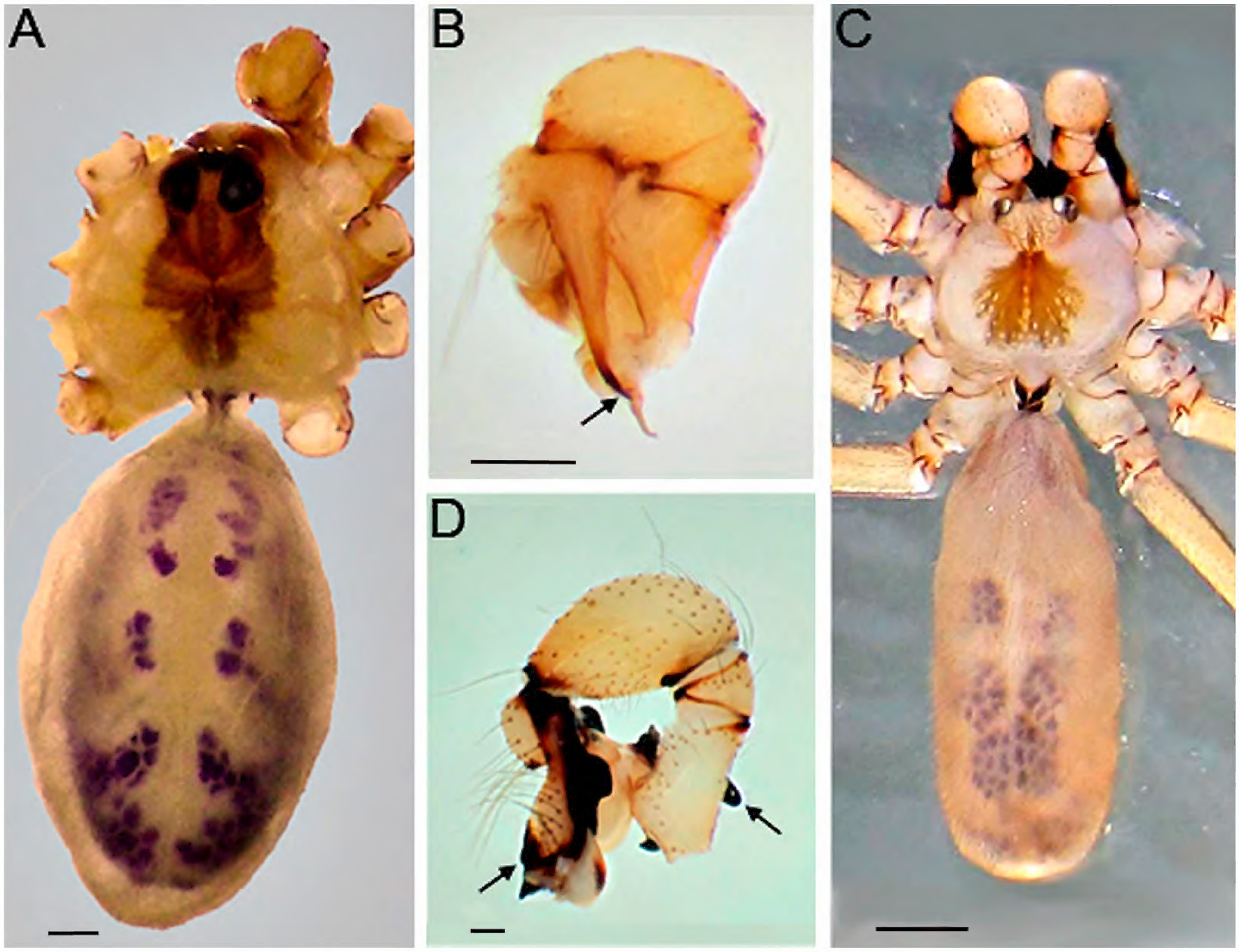

Figure 6. *Aymaria calilegua* male. **A**, dorsal view. **B**, left palp retrolateral view. *Pholcus phalangioides* male. **C**, dorsal view. **D**, left palp retrolateral view. Scale lines: 0.2 mm (A, B, D), 1 mm (C).

Aymaria calilegua Huber, 2000
(Figures 5 and 6A–B)

Diagnosis. *A calilegua* is distinguished from congeners by the serrated tip of the procursus (see arrow in Figure 6B), the shape of the epigynum, and by the larger male cheliceral apophyses (Huber 2000).

Distribution and habitat. Previously, *A. calilegua* was known only from Yungas environments (Huber in press). Here, we add records in Calilegua National Park (Jujuy), corresponding to Caimancito oilfield, and the north margins of Zanjón Seco string, close to the previously known locality reported for this species. In addition, we provide new records of *A. calilegua* for the Chaco Serrano ecoregion of Salta province (ecoregion neighboring the Yungas).

Specimens examined: Argentina. Jujuy province: Ledesma department: Calilegua National Park, Caimancito oilfield, Oil Well #35 (23°37′10″ S, 064°36′03″ W), immature, 26 October 2010, MCN-IEBI #003-000248; Calilegua National Park, margins of Zanjón Seco string (23°41′04″ S, 064°34′33″ W), immature, 07 June 2011, MCN-IEBI #003-000250; Same loc. (23°41′08″ S, 064°34′28″ W), immature, 7 June 2011, MCN-IEBI #003-000251; same locality (23°41′13″ S, 064°34′26″ W), 2 males, 2 females, 2 immatures, 7 June 2011, MCN-IEBI #003-000249. Salta province: La Viña department: Provincial Route #47, 9 km E of Cabra Corral dam (25°17′10″ S, 065°15′08″ W), immature, 27 April 2007, MCN-IEBI #003-000247.

Pholcus Walckenaer, 1805

Distribution and habitat. *Pholcus* is the most species-rich genus of Pholcidae with currently 306 species (Huber 2011; World Spider Catalog 2014). *Pholcus* includes mostly fairly large and long-legged spiders and includes species from all habitats known to be potentially available to pholcid spiders, while most species seem to occur in larger protected spaces (Huber 2011).

Pholcus phalangioides (Fuesslin, 1775)
(Figures 5 and 6C–D)

Diagnosis. *P. phalangioides* is distinguished from other species of the genus by the morphology of the male palp characterized by the procursus with distinctive

sclerites distally and a curved appendix (see arrows in Figure 6D), and the shape of the female genitalia (Huber 2011).

DISTRIBUTION AND HABITAT. This is a cosmopolitan species widely distributed in temperate and subtropical regions, very common in buildings and other human structures (Huber 2011). Even though it is a cosmopolitan species, few records are known for Argentina corresponding to Misiones, Santiago del Estero, Corrientes, Córdoba and Rio Negro provinces (Huber, in press). No exact collection data were reported by previous authors, except for Buenos Aires province as could be found in SNDB (2014). Here, we give two new records which constitute the first records for Salta province.

SPECIMENS EXAMINED: Argentina. Salta province: San Martin department: General Mosconi City (22°35′35″ S, 063°48′59″ W), female, January 2014, MCN-IEBI #003-000904; Salta Capital department: Salta City (24°44′07″ S, 065°24′00″ W), male, July 2014, MCN-IEBI #003-000903.

This paper provides data to increase the knowledge on the diversity and distribution of Pholcidae to northern Argentina. Assemblies of spiders are difficult to fully sampled, often due to the large number of rare species recorded (Haddad et al. 2009). For Argentina, a previous study (Huber in press) reported a relatively low species diversity of Pholcidae, maybe due to lacks of collecting spider in many areas of the country, and the absence of arachnologists who have studied this spider family. Therefore, the new records provided here to seven species of six genera are important, especially with regards to the new occurrence for the country. As result, the geographical limits of distribution of some species are also enlarged to important environments of our country.

To date, few studies have devoted to revise the spider fauna of Argentina, especially in the North, added to a low taxonomic knowledge for the majority of Argentine spider families. The new records here provided allow a better understanding of the Pholcidae distribution in our country.

Northern Argentina has a wide variety of ecoregions, most of them with a high biodiversity, such as humid forests of the Yungas and Selva Paranaense. Some ecoregions are also noteworthy for being unique across America independent of their biodiversity. Despite of their biological importance some environments have a high degradation level, as the Monte de Sierras y Bolsones ecoregion, partly due to natural desertification processes and anthropogenic activities (González Reyes et al. 2012). The Argentine Chaco is a dry, subtropical, woodland system classified as "vulnerable" by Dinerstein et al. (1995), and listed as the most important ecoregion in our country for conservation (Bertonatti and Corcuera 2000). In Corrientes province, the Campos y Malezales ecoregion is characterized by a combination of remnant forest patches of the Paranaense Forest ecoregion, intermingled with short grasslands and, occasionally, with marshy communities (Arturi 2006). The Esteros del Iberá ecoregion is a system of marshes and lakes considered one of the most important wetlands in Latin America.

The data provided in this paper could be of interest in conservation plans because spiders are widely recognized as indicators of environmental quality and can be used to monitor the effects of disturbances on biodiversity (Pearce and Venier 2006; Pinkus-Rendón et al. 2006; Hsieh and Linsenmair 2011). According to Huber (2014), the Pholcidae family is more diverse in the pristine forests and has a high percentage of endemic species. Northern Argentina, more precisely the northwest, is suffering a reduction in their native habitats due to the advance of the agricultural frontier. As result, habitat fragmentation has serious implications for the conservation of pholcids, making them particularly vulnerable to extinction (Huber in press).

In conclusion, *G. yaculica* was reported for the provinces of Jujuy and Salta, and we collected specimens in different localities of the province of Jujuy, and in Corrientes province, expanding its distribution to northeast Argentina. Huber (2000, in press) reported specimens of *G. goloboffi* in arid environments in the provinces of Tucuman and Salta. We enlarge the northern limit of their distribution reporting specimens for the Yungas ecoregion in the province of Salta. The distribution of *M. uruguayensis* was previously known from the provinces of Misiones and Entre Ríos (Argentina), Brazil and Uruguay (Machado et al. 2013). In this paper, *M. uruguayensis* is reported for the first time in the province of Corrientes, northeastern Argentina. *Chibchea salta* was already recorded for the provinces of Salta and Jujuy, and the distribution limit is extended here to the northeastern and northwestern parts of both provinces. The new record of *N. atacama* for Argentina (Salta), enlarges its distributional range by 674 km northeast of Huasco (Chile), and also expands the altitude at which the species can inhabit, 2,274 m a.s.l instead of 1,200 m a.s.l as previously recorded for Chile. *Aymaria calilegua* were collected in the Chaco Serrano ecoregion Salta province, enlarging its distribution to the south. Finally, we formalize the record of *P. phalangioides*, a cosmopolitan species, for the province of Salta.

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